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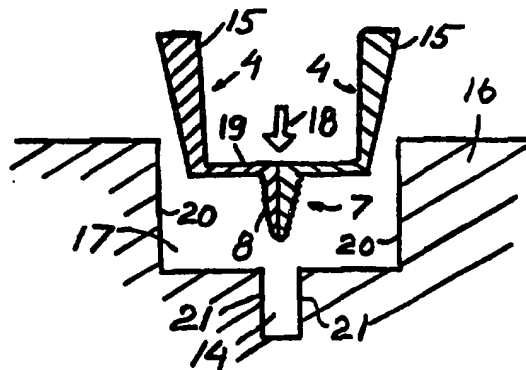
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(54) Title: GUIDE RAIL OF PLASTIC IN A WINDOW OR DOOR FRAME GROOVE

(57) Abstract

The invention relates to a plastic profile (1) for making a sliding rail or guiding of one or more elements included in a window- or door-structure either directly or via different mounting means and said guiding rail is intended to be located in a groove (17) formed in the frame or sash material of the window- or door-structure. In an unassembled condition the plastic profile (1) consists of a relatively thin, elongated piece of material which has the form of a staggered elongated wave formation comprising at least one folding line (3) provided upon and in a trough of a wave or below and in a crest of a wave, said wave formation during folding of said mainly plane, waveformed material piece to a U-form constitutes a protruding locking tongue (7) having adjacent wall parts together forming a bottom in the sliding rail having perpendicularly extending side sections (4) thereto and said locking tongue (7) is lockably cooperable with at least one mounting slot (14) cut out in the bottom of the groove (17).



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Guide rail of plastic in a window or door frame groove.

The present invention relates to a plastic profile for making a sliding rail or guiding of one or more elements included in a window- or door structure either directly or via different mounting means and said guiding rail is intended to be located in a groove (17) formed in the frame- or sash material of the window- or door structure.

In manufacturing of windows different details are used to incorporate different mounting functions in these. Different types of cut outs for mountings and rails are made in the frame- and sash material in order to fit in these parts. A cut out in a wooden part is to be used to guide a mounting in a sliding rail. These functions are used in a H-window in order to guide the sash part in a movement which gets the inside of the window sash to turn outwards. Of course you can also think about other functions for a sliding rail mounted into a window.

The problems with the sliding rails of today which are manufactured either of aluminium or plastic material are a lot of. For the aluminium rail the problem is that it must be inserted into the frame part through a hole or opening at the side of the window. This depends on that the rail has a flange which is cut towards the side in the cut out U-groove. It means that the rail cannot be put into the groove since the flange is in its way. In order to make this metal rail to be in place these flanges are used as locking elements.

Another problem with aluminium rails is that they are very bulky, take up a large storing place and they are difficult to mount. They are manufactured in not bendable, straight lengths having a predetermined length. They are cut in desired lengths and thereafter they are guided into said cuts in the windows from the outside. All this must be done manually and no automatic mounting of said sliding rail into the cut groove can be achieved. Further, aluminium rails have a tendency to corrode and age when they in time are subjected to wind and weather. Then you will get problems with the sliding function when the sliding mounting shall slide in the sliding rail. The

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sliding surfaces then will be too raw and the sliding mounting will jamb.

All problems described above have done that today there is a sliding rail of plastic which has folding lines. The actual U-form which the sliding rail will accept is provided in connection with the insertion into the cut out groove. This profile with other words lies flat as a band stored on a bobbin in layers one upon another and not side by side. The profile in question is in the vertical sides of the U-formation provided with extensions which shall engage the edges of wood groove in corresponding smaller, cut out grooves. The intention with this old plastic profile is that the flat band shall be easy to store on a bobbin and to be placed into the groove without that you need to insert it into the hole from one side.

The structure described above does not function well. First the rolling up on a bobbin has not function satisfactory. When the bobbin has got a certain amount of meters of band stored one upon each other these layers will tilt and so the bobbin must have two guiding sides to function. The small barbs disturbe the winding of layers so that it is difficult to get the wounds to lie exactly one above the other. Besides there is unnecessary much air between the layers. When the band thereafter shall get into a U-profile and be put down into the cut out groove in the window other problems will arise with this old solution. When the folding occurs at the two folding lines on the flat plastic band the folding shall be so large that the locking barbs get free during the pressing down movement into the groove. The folding lines lie in the corners of the U-profile on the inside. It will be difficult to get the side of the U to press against the sides of the cut out groove if the folding lines are so large and deep so that the folding can be so strong that the locking elements go free until they will be in the level with the corresponding small groove in the two sides in the cut out of the wood groove. Therefore one has to chose in making weakly marked folding lines and to get big problems with the mounting of the profile or in making large folding lines but then having problems with a too big play where the sides of the profile do not fit or

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press against the sides of the cut out.

Further it is not suitable from a point of view of manufacturing to cut grooves in wood profiles which have further grooves towards the side edges. All grooves which are cut where some part of the groove is deeper below the surface where the groove itself begins i.e. at the entrance of the hole is broader than at the top, require that one cuts from the end of the wood material and further out to the end. Otherwise one cannot get out the cutting tool. These cuttings take a lot of time to make why the cutting material cannot so easy get out from the groove. One risks to jam the tool if one drives it too fast. Besides you cannot make grooves which begin and end within the ends of the wood profile. The cutting which must be made from one end to the other, creates a unnecessary hole in the sides of the window. Besides you have to cut the pieces before the mounting of the window. Further you cannot make the groove shorter than the length of the wood profile if it is needed.

The plastic profile described above will also be difficult to take away if it has to be changed. On one hand depending on that it is locked into the hole which is in the wood part which extends perpendicularly to that having the groove and on the other since the barbs in the side of the plastic profile are locked in the vertical side grooves of the U-cut out.

Another problem is the two folding zones which make that the stability in the U during mounting can be bad. During pressing in process this old plastic profile can be inserted oblique in the groove where one side reaches the bottom of the groove earlier. The sides of the profile in this case do not help to guide the profile downwards into the groove.

With other words the plastic profile described above is difficult to get to function in reality in a satisfactory way. The object with this profile is that it should be friendly as to the production and be used during an automatically mounting.

The object with the present invention is to provide a plastic profile of the type described above by which the problems

mentioned above concerning the aluminium profile and the plastic profile have been solved. The distinguishing features according to the present invention are set forth in the following claims.

Thanks to the invention a plastic profile has been achieved which in an excellent way fulfils its purposes and which in the same way is very cheap to manufacture. By the staggered elongated wave formation of the profile it can be easily wound up on a bobbin, whereby the different layers guide each other so that they do not fall off or tilt in spite of that one only wounds the profile against one supporting side. The plastic profile is easy to mount into the groove and can also with simple hand grips be dismounted if needed. By the apex formed locking tongue protruding out from beneath of the profile, a secure fixing in position of the plastic profile in the groove is achieved. The mounting movement of the plastic profile occurs in parallel with the depth of the groove and can be done mechanically.

The invention shall now be described further in detail by aid of an example preferred by reference to the drawing enclosed, in which

- Fig. 1 shows the plastic profile according to the present invention in an unmounted condition and in which it has a staggered elongated wave formation,
- Fig. 2 shows that position the plastic profile according to Fig. 1 is located after folding together along its folding line,
- Fig. 3 shows the plastic profile in a mounted position in a groove cut out in a window frame.
- Fig. 4 shows the winding up of the plastic profile according to Fig. 1 onto a bobbin,
- Fig. 5 shows the mounting of the plastic profile according to Fig. 2 in a condition folded together,

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Fig. 6 shows an alternative embodiment of a groove with a mounting slot for the plastic profile and

Fig. 7 shows another embodiment of the plastic profile according to the present invention in a mounted condition.

As can be seen from the drawings the plastic profile 1 according to a preferred embodiment of the invention consists of a relatively thin elongated piece of material, which in an unmounted state forms a staggered elongated wave formation and in which condition it is uncoilable onto a bobbin 2. The plastic profile 1 includes a side section or leg 4 with corners 5 on each side of a folding line 3, said sections or legs 4 are stiff and have an angle of about 90°. The central wave formation 6 of the plastic profile 1 forms in a folded together condition a centrally protruding, apex formed locking tongue 7, which comprises barbs 8.

Around said folding line 3, which according to the preferred embodiment extends centrally along the longitudinal direction of the plastic profile 1, the wave formed plastic profile 1 can be folded together to an U according to Fig. 2, from the position illustrated in Fig. 1. Of course the apex formed locking tongue 7 depending on existing circumstances can protrude anywhere from the bottom section of said plastic profile 1.

The plastic profile 1 can be manufactured according to extruder technich i.e. it is extruded in a long length which after that is wound up onto the bobbin 2 which only need one supporting side 9. Thanks to the special form of the plastic profile 1 according to Fig. 1, it can preferably be rolled up onto the bobbin 2 with its different layers 10,11,12,13 and so on matching into each other according to Fig. 4, whereby a good guiding is achieved, so that they do not tilt in spite of one only uses one supporting side 9. The different legs or side sections 4 in the wave formation are suitably angled in order to that one conical figure to the figure of the next revolution shall fit perfectly into each other.

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The plastic profile 1 can be rolled off during a window manufacturing process and be mounted correctly into the cut out groove 14, see Fig. 5. Then the side sections 4 can be some conical 15 in order to better match into a groove 17 made in a frame 16 or the like. By mounting of the wave formation according to Fig. 1 a pressure force is achieved in the direction of the arrow 18 towards the bottom 19 of the formed U according to Fig. 5. The edges 20 of the groove 17 then urge the U-profile to look like that one illustrated in Fig. 2, where the side sections 4 mainly point straight outwards. The angle of the corners 5 then is about 90° or some more so that during a ready pressed down condition the side sections 4 shall be able to press against the edges 20 according to Fig. 3.

One embodiment having stiff, rigid angles without folding lines in the corners, according to Fig. 2, is to prefer. This, in order to get better press force against the edges 20 and to get better guidance during the mounting of the profile 1 into the groove and to reduce the tilting risk. Of course one can think about to have folding lines in the corners 15 to put the invention into practice but it is not to prefer.

By pressing the wave formed plastic profile 1 into the groove 17 according to Fig. 5 the profile is urged downwards with its apex formation in the form of the locking tongue 7 into the mounting slot 14. The locking tongue 7 has at least one barb 8 on each side to create friction against the mounting slot 14 during the press down operation. When the wave formed plastic profile has taken the U-profile form and is totally pressed down into the groove 17 according to Fig. 3, the profile lies correctly in its position and is kept in place by the stiff side sections 4 which do not have any extensions but instead said locking tongue 7, the barbs 8 of which press against the side walls 21 of the mounting slot 14 and in trying to take away the profile 1 the barbs 8 are pressing still stronger against the side walls 21. In changing the plastic profile 1 a thin blade of a knife or the like can be pressed between one of the side sections 4 and an edge 20 of the groove 17 from above. Then the pressure gets less from the barbs 8 against the side walls 21 and the profile 1 can be removed. It is thus

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possible with this embodiment to cut out grooves in the wood parts without having tools at hand which must cut from one end to another so that one later on has the possibility to remove the profile 1. Since the groove 17 has edges 20 which are not broader than its beginning opening it is possible to cut how short grooves one likes with simple tools where the cutting speed can be increased compared with cutting tools with extensions or shoulders towards the sides. The grindings flies easier out and do not get stuck in the groove 17. There will neither become openings in the edges of the window, since cutting can occur without that you need to cut from one end to the other of said wood profiles before the window is mounted together.

The apex formed locking tongue 7 of the U-profile 1 thus has the fastening function to fix the plastic profile 1 in position into the groove 17 by aid of the mounting slot 14. Besides the side walls 21 enclose that opening which from the beginning exists in the central wave formation 6 of the plastic profile 1, so that the U-profile 1 will be correctly formed and tight both in its bottom of the U and towards the bottom of the groove 17.

In Fig. 6 an alternative embodiment is illustrated of the mounting slot 14 of the groove 17 for the plastic profile 1 and in Fig. 7 an alternative embodiment is illustrated of the locking tongue 7 of the plastic profile 1, which here is provided with two, just opposite each other located barbs 8, which are situated at the region of the folding line 3 and in the apex formation of the locking tongue 7.

Claims

1. Plastic profile for making a sliding rail or guiding of one or more elements included in a window- or door structure either directly or via different mounting means and said guiding rail is intended to be located in a groove (17) formed in the frame or sash material of the window- or door structure, **characterized** in that the plastic profile (1), which consists of a relatively thin, elongated piece of material, in an unassembled condition forms a staggered elongated wave formation comprising at least one folding line (3) provided upon and in a trough of a wave or below and in a crest of a wave, said wave formation during folding of said mainly plane, waveformed material piece to an U-form constitutes a protruding locking tongue (7) having adjacent wall parts together forming a bottom in the sliding rail having perpendicularly extending side parts (4) thereto and said locking tongue (7) is lockably cooperable with at least one mounting slot (14) cut out in the bottom of the groove (17).

2. Plastic profile according to claim 1, **characterized** in that the locking tongue (7) is provided with at least one barb (8) for locking against the side walls (21) of the mounting slot (14).

3. Plastic profile according to claim 1, **characterized** in that the folding line (3) is located in a centrally located wave formation (6) and that during folding along the folding line (3) the side parts (4) of the profile (1) forms the U-form having the locking tongue (7) centrally protruding from the same.

4. Plastic profile according to claim 1, **characterized** in that the plastic profile (1) before mounting is provided to be rolled up on a bobbin (2).

5. Plastic profile according to claim 1, **characterized** in that the side parts or legs (4) of the plastic profile (1) folded together to the U-form are conically formed.

6. Plastic profile according to claim 1, characterized in that the corners (5) and connections of the U-formed plastic profile (1) towards the apex formed locking tongue (7) are stiff and said plastic profile (1) is foldable only along the wave formations.

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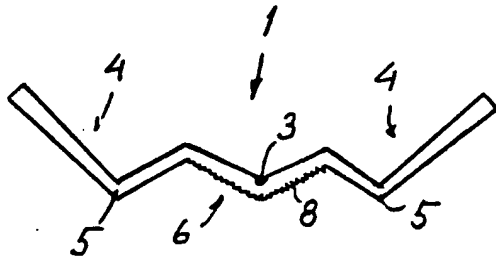


Fig. 1

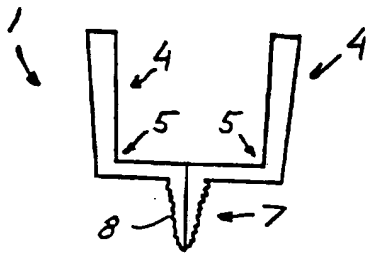


Fig. 2

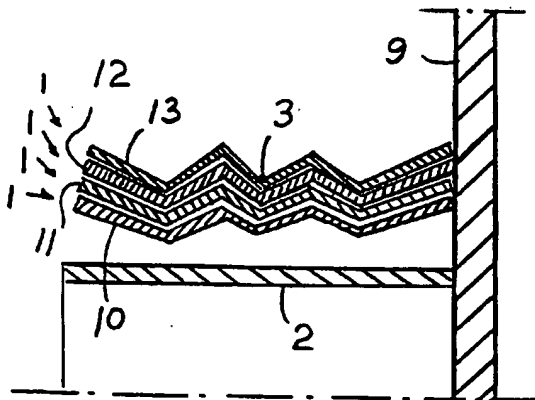


Fig. 4

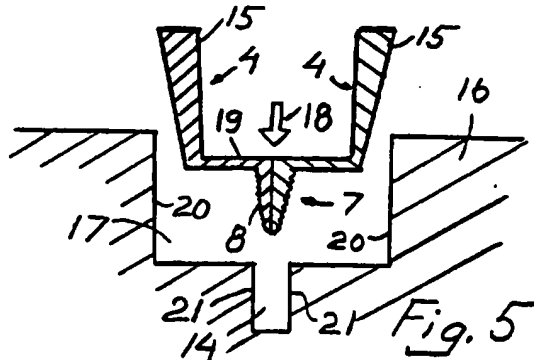


Fig. 5

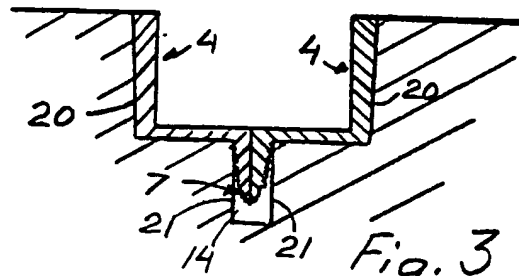


Fig. 3

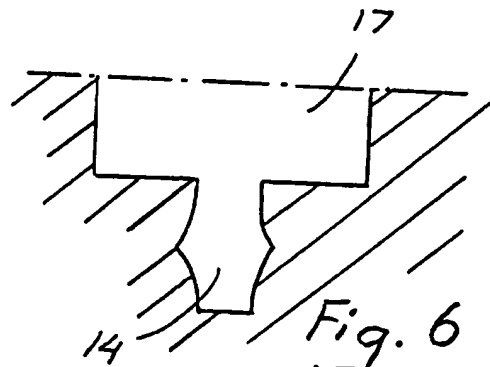


Fig. 6

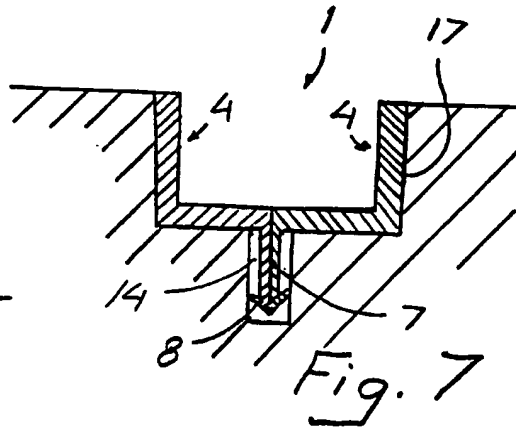


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 94/00723

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: E06B 3/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 5194309 (R. KNUDSEN), 16 March 1993 (16.03.93), column 4, line 3 - line 57, figures 4, 5, 6 --	1,3,4,6
A	US, A, 2021179 (J.H. FOX), 19 November 1935 (19.11.35), figure 5 --	1
A	FR, A1, 2673229 (PADIOU, P.), 28 August 1992 (28.08.92), figure 1 --	1,2
A	DE, A1, 3546207 (BISCHOFF, R.), 2 July 1987 (02.07.87), figures 11-12 --	1

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 2821430 (J.R. GREDE), 28 January 1958 (28.01.58), figures 1-4 --	1
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/SE 94/00723

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
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FR-A1-	2673229	28/08/92	NONE		

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US-A-	2821430	28/01/58	NONE		

SE-A-	9301585	08/11/94	NONE		
